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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* HEUNG-BAE LEE

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Appeal 2009-005230  
Application 09/738,900  
Technology Center 2600

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Decided: December 8, 2009

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Before KENNETH W. HAIRSTON, MAHSHID D. SAADAT  
and MARC S. HOFF, *Administrative Patent Judges*.  
HAIRSTON, *Administrative Patent Judge*.

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 to 3. We have jurisdiction under 35 U.S.C. § 6(b). We will sustain the rejection.

Appellant's invention is concerned with a radio frequency (RF) reception system for radio communication having a direct-conversion

demodulator (Abstract; Spec. 1:3-5; 3:11-4:12; Fig. 2). Appellant discloses and claims such a system and demodulator having a detector for detecting a gain control level and an automatic gain control (AGC) for controlling gain in the demodulator according to the detected gain control level (claims 1 and 3).

Claim 1, reproduced below with emphasis added, is representative of the subject matter on appeal:

1. A direct-conversion demodulator in a RF reception system for radio communication comprising:

a down mixer for mixing a received RF signal and carrier signals, and thereby converting the RF signal into baseband signals of channels I and Q;

a filter for filtering high-frequency components of the baseband signals of the two channels output from the down mixer;

*a detector for detecting a gain control level corresponding to the difference obtained by comparing the levels of the baseband signals of the two channels output by the filter with a predetermined level;*

*an AGC for controlling gains of the baseband signals for each of the two channels output from the down mixer according to the gain control level detected by the detector;*

a differentiator for differentiating the baseband signals of the two channels output from the filter;

a multiplier for cross multiplying the baseband signals of the two channels output from the differentiator and the baseband signals of the two channels output from the filter; and

an adder for adding the baseband signals of the two channels output by the multiplier and thereby detecting data. (Claim 1 (emphasis added)).

The Examiner relies upon the following as evidence of unpatentability:

Appellant's Admitted Prior Art (APA), Figure 1 of the Drawings,  
Specification at page 1, line 9 through page 3, line 9

Hiroshi Tsurumi<sup>1</sup> (Hiroshi)<sup>2</sup>      JP 06244754 A      Sep. 2, 1994

The following sole rejection is before us for review:

Claims 1 to 3 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Appellant's Admitted Prior Art of Figure 1 (APA) in view of Hiroshi.

The Examiner relies upon APA as disclosing all of the recited elements of independent claims 1 and 3, except for the detector and AGC (Ans. 3). The Examiner relies upon Hiroshi as disclosing a detector and AGC (Ans. 4-5).

Appellant does not dispute the teachings or suggestions of APA, nor does Appellant dispute the motivation provided by the Examiner (*see* Ans. 5, "so that the output signal of the prior art is maintained at a constant level and the data is detected correctly") for combining APA with Hiroshi. Instead, Appellant argues (App. Br. 10-14; Reply Br. 4-8), *inter alia*, that Hiroshi fails to disclose or suggest a detector and AGC, and that the output from Hiroshi's detector 4202 is integrated. Appellant contends that it would not

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<sup>1</sup> Since the Examiner used the inventor's first name, we will do the same for the sake of consistency in the record.

<sup>2</sup> Throughout this decision, we refer to the official translation of Hiroshi provided to the USPTO by FLS, Inc. and made of record February 2009 (PTO-09-2880). Appellant does not dispute the validity of the translation.

have been obvious to omit the integration feature from Hiroshi because circuitry would have to be modified on the input side to accommodate the elimination of the integrator.

Appellant makes the foregoing arguments solely based on an analysis of independent claim 1 with respect to the teachings of Hiroshi. Both independent claims 1 and 3, along with claim 2 which depends from claim 1, contain the general features of a detector and an AGC. We consider claim 1 as being representative of the group of claims (claims 1 to 3) which stand rejected under 35 U.S.C. § 103(a) as unpatentable over APA and Hiroshi. *See* 37 C.F.R. § 41.37(c)(1)(vii).

#### ISSUE

Based on Appellant's arguments, the issue is: Has Appellant demonstrated that the Examiner erred in finding that the combined teachings of APA and Hiroshi disclose or suggest a detector and AGC, as set forth in representative claim 1?

#### FINDINGS OF FACT

1. As indicated *supra*, Appellant describes and claims a radio frequency (RF) reception system for radio communication having a direct-conversion demodulator (Abstract; Spec. 1:3-5; 3:11-4:12; Fig. 2), wherein the demodulator has an AGC detector 270. Appellant's Figure 3 shows the detector 270 in greater detail. The AGC detector 270 is described as (i) detecting a gain control level, and (ii)

- controlling gain in the demodulator according to the detected gain control level (Spec. 6:8-7:18; claims 1 and 3).
2. Appellant's Admitted Prior Art discloses a radio frequency (RF) reception system for radio communication having a direct-conversion demodulator (Spec. 1:9-3:9; Fig. 1), but no AGC loop.
  3. Hirsoshi describes a radio frequency receiver (Figs. 1, 27(a), 27(b)) which can include an AGC loop. The RF receiver also includes a down mixer 109 to create baseband signals on two channels, filters 110 and 111 for the channels, and a baseband amplifier 114 (Fig. 1; ¶¶ [0033], [0034]). The AGC loop (Figs. 27(a) and (b)) includes a gain control circuit 4202 that detects a gain control level and controls gain according to the detected level (¶ [0120]) as shown in Figure 27(b)). The gain control circuit 4202 controls gains of baseband signals for two channels from down mixer 109 by comparing a detected difference of the baseband signals in the two channels with a reference level Ref and then integrating the result (Fig. 27(b)).

## PRINCIPLES OF LAW

### *Claim Construction*

"During examination, 'claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.'" *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (citation omitted); *In re Morris*, 127 F.3d 1048, 1053-54 (Fed. Cir. 1997).

*Obviousness*

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). The Examiner's "articulated reasoning . . . in the rejection must possess a rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

The Examiner bears the initial burden of presenting a prima facie case of obviousness, and Appellants have the burden of presenting a rebuttal to the prima facie case. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See Kahn*, 441 F.3d at 985-86.

ANALYSIS

*Claims 1 and 2*

We will sustain the Examiner's rejection with respect to representative claim 1 for the reasons that follow. We agree with the Examiner's findings of fact and conclusions of obviousness with respect to claim 1 (Ans. 3-8), and adopt them as our own, along with some amplification of the Examiner's explanation of the teachings of Hiroshi (FF 3). *See Fine*, 837 F.2d at 1073; *Kahn*, 441 F.3d at 988.

Representative claim 1 recites "a detector for detecting a gain control level *corresponding to* the difference obtained by comparing the levels of the baseband signals of the two channels output by the filter with a predetermined level" and "an AGC for controlling gains of the baseband

signals for each of the two channels output from the down mixer *according to the gain control level detected by the detector*” (claim 1 (emphases added)). Claim 3 contains almost identical language. Claim 1 merely requires that the detector take action *corresponding to* the difference found from the comparison using the predetermined level, and that the control be *according to* such detection. The language of claims 1 and 3 broadly encompasses an AGC detector that detects and controls gain. *See Am. Acad. of Sci. Tech Ctr.*, 367 F.3d at 1364.

As indicated *supra* (FF 3), Hiroshi describes an AGC detector 4202 used in an automatic control gain circuit as shown in Figure 27 (a). Hiroshi provides a more detailed depiction of the AGC detector 4202 in Figure 27(b). As seen in Figure 27(b) the AGC detector 4202 includes an integrator (FF 3).

The use of the phrases *corresponding to* and *according to* found in claim 1 broadly encompasses an AGC detector that may also happen to integrate, as in Hiroshi. The detector and AGC as set forth in claim 1 do not positively require that there be *no* integration.

In other words, just because Hiroshi’s AGC detector 4202 output is also integrated does not interfere with that AGC detector’s ability to perform the functions recited in the detector and AGC clauses of Appellant’s claim 1.

The Examiner has provided articulated reasoning with a rational underpinning to support the combination for the legal conclusion of obviousness (Ans. 3-8). *See Kahn*, 441 F.3d at 988. We agree with the Examiner that Hiroshi discloses or suggests a detector and AGC. We also agree with the Examiner that it would have been obvious to omit the



integrator function from the circuit of Hiroshi in modifying APA to include gain control (Ans. 8). However, we interpret claim 1 to broadly encompass a detector that detects a gain control level “corresponding to” a difference of a comparison, and an AGC to control gain “according to” the detected gain control level, such that integration could also be present.

Once the Examiner has satisfied the burden of presenting a prima facie case of obviousness, the burden then shifts to Appellant to present evidence and/or arguments that persuasively rebut the Examiner’s prima facie case. *See Oetiker*, 977 F.2d at 1445.

Appellant’s arguments (App. Br. 10-14; Reply Br. 4-8) that Hiroshi discloses an integrated output from the AGC detector 4202, and therefore cannot be considered analogous to the detector and AGC recited in claim 1 (which operates on a difference of a comparison), are unconvincing in light of our findings as to Hiroshi (FF 3) and our interpretation of claim 1 discussed *supra*. Even if it were necessary to modify Hiroshi by removing the integrator from the AGC circuit shown in Hiroshi’s Figure 27(b) to meet the claim language, we agree with the Examiner (Ans. 8) that such a modification would have been obvious to one of ordinary skill in the art at the time of Appellant’s invention.

We are not persuaded by Appellant’s contention (App. Br. 13; Reply Br. 7) that removal of the integrator from Hiroshi, which might require functions of other elements in the circuit to be changed to accommodate the elimination of the integrator, would not be obvious. Omission of an element *and its function* is an obvious expedient where the function is not desired.

*In re Kuhle*, 526 F.2d 553, 555 (CCPA 1975). To delete the integrator and its function from Hiroshi would be an obvious expedient reducing the cost and complexity of the RF receiver, and would only involve common sense. Only inferences and creative steps normally expected from the ordinarily skilled artisan would be required to remove the integrator and its function. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007).

Appellant has not demonstrated that the Examiner erred in relying on Hiroshi as disclosing or suggesting a detector and AGC, at least to the extent that these features are broadly set forth in representative claim 1. *See Am. Acad. of Sci. Tech Ctr.*, 367 F.3d at 1364.

In view of the foregoing, we will sustain the obviousness rejection of representative claim 1. The same holds true for claim 2, which depends from claim 1.

### *Claim 3*

Appellant has not presented any patentability arguments as to claim 3 other than stating that the Examiner failed to make a prima facie case of obviousness since Hiroshi fails to disclose the detector and AGC (*see* App. Br. 10; Reply Br. 5). Claim 3 contains the same argued features of claim 1, namely the detector and AGC. Accordingly, the rejection of claim 3 is sustained for similar reasons applied to representative claim 1.

## CONCLUSION OF LAW

Appellant has not shown that the Examiner erred in finding that Hiroshi discloses or suggests a detector and an AGC, as set forth in representative claim 1.

**ORDER**

The decision of the Examiner to reject claims 1 to 3 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

**AFFIRMED**

**KIS**

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